



Docket No.: 18396 1074
Date of Deposit: August 9, 2002

SEQUENCE LISTING

<110> Doorbar, John

<120> IMPROVEMENTS IN OR RELATING TO SCREENING FOR PAPILLOMA

VIRUSES

<130> 18396/1074

<140> 10/008,524

RECEIVED

<141> 2001-11-05

AUG 19 2002

Technology Center 2100

<150> 09/314,268

<151> 1999-05-18

<160> 179

<170> PatentIn Ver. 2.1

<210> 1

<211> 375

<212> DNA

<213> Human papillomavirus type 16

<430> 1

tagagtgaac taaaatggat cggcgcctct ctaggagcag attacaggtg qaqtttgat 240
gaaacagtga ctcatttcat ctagcaaggg cggccaaatg acactaatcg ggagtataaa 300
tctgtaaaag aaagaggagt acacattgtt tccgagcact ggcttttaga ttgtgccaa 360
gagtgtaaac atctt 375

<210> 2

<211> 125

<212> PRT

<213> Homo sapiens

<400> 2

Ala Leu Pro Leu Ser Glu Val Ile Val Lys Asn Leu Gln Leu Ala Leu

1

5

10

15

Ala Asn Ser Ser Arg Asn Ala Val Ala Leu Ser Ala Ser Pro Gln Leu

20

25

30

Lys Glu Ala Gln Ser Glu Lys Glu Glu Ala Pro Lys Pro Leu His Lys

35

40

45

Val Val Val Tyr Val Ser Lys Lys Leu Ser Lys Lys Val Ser Glu Leu

50

55

60

Asn Asp Thr Ala Ala Ser Leu Val Asp Tyr Asn Thr Ser Phe Asp

85

90

95

Arg Glu Tyr Lys Ser Val Lys Glu Arg Gly Val His Ile Val Ser Glu

100

105

110

His Trp Leu Leu Asp Cys Ala Gln Glu Cys Lys His Leu

115

120

125

<210> 3

<211> 491

<212> PRT

<213> Homo sapiens

<400> 3

Ala Pro Glu Glu His Asp Ser Pro Thr Glu Ala Ser Gln Pro Ile Val

1

5

10

15

Glu Glu Glu Glu Thr Lys Thr Phe Lys Asp Leu Gly Val Thr Asp Val

20

25

30

Ile Tyr Ile Ala Lys Asp Gln Leu Gly Trp Thr Lys Pro Thr Lys Ile

35

40

45

Gln Ile Thr Ala Tyr Ser Ser Ala Leu Glu His Asp Ile Ile Asp

65

70

75

80

Leu Asn Ala Leu Leu Glu Thr Pro Gln Arg Leu Phe Ala Leu Val Leu

85

90

95

Thr Pro Thr Arg Ser Trp Pro Phe Arg Ser Gln Ser Ser Leu Lys Pro

100

105

110

Trp Ser Ser Ile Gly Val Gln Ser Ala Val Ile Val Gly Gly Ile Asp

115

120

125

Ser Met Ser Gln Ser Leu Ala Leu Ala Lys Lys Pro His Ile Ile Ile

130

135

140

Ala Thr Pro Gly Arg Leu Ile Asp His Leu Glu Asn Thr Lys Gly Phe

145

150

155

160

Asn Leu Arg Ala Leu Lys Tyr Leu Val Met Asp Glu Ala Asp Arg Ile

165

170

175

Leu Asn Met Asp Phe Glu Thr Glu Val Asp Lys Ile Leu Lys Val Ile

180

185

190

Pro Arg Asp Arg Lys Thr Phe Leu Phe Ser Ala Thr Met Thr Lys Lys

195

200

205

Val Ser Ser Lys Tyr Gln Thr Val Glu Lys Leu Gln Gln Tyr Tyr Ile

225

230

235

240

Phe Ile Pro Ser Lys Phe Lys Asp Thr Tyr Leu Val Tyr Ile Leu Asn

245

250

255

Glu Leu Ala Gly Asn Ser Phe Met Ile Phe Cys Ser Thr Cys Asn Asn

260

265

270

Thr Gln Arg Thr Ala Leu Leu Leu Arg Asn Leu Gly Phe Thr Ala Ile

275

280

285

Pro Leu His Gly Gln Met Ser Lys Arg Leu Gly Ser Leu Asn Lys Phe

290

295

300

Lys Ala Lys Ala Arg Ser Ile Leu Leu Ala Thr Asp Val Ala Ser Arg

305

310

315

320

Gly Leu Asp Ile Pro His Val Asp Val Val Val Asn Phe Asp Ile Pro

325

330

335

Thr His Ser Lys Asp Tyr Ile His Arg Val Gly Arg Thr Ala Arg Ala

340

345

350

Leu Phe Gln Arg Ile Glu His Leu Ile Gly Lys Lys Leu Pro Gly Phe

370

375

380

Pro Thr Gln Asp Asp Glu Val Met Met Leu Thr Glu Arg Val Ala Glu

385

390

395

400

Ala Gln Arg Phe Ala Arg Met Glu Leu Arg Glu His Gly Glu Lys Lys

405

410

415

Lys Arg Ser Arg Glu Asp Ala Gly Asp Asn Asp Asp Thr Arg Gly Cys

420

425

430

Tyr Val Cys Gln Glu Gln Gly Gly Trp Arg Lys Asn Glu Glu Ala Glu

435

440

445

Arg Pro Leu Ile Thr Phe Met Lys Ala Arg Val Leu Leu Phe Cys Lys

450

455

460

Arg Glu Leu Glu Asn Glu Thr Cys Ser Asn Arg Asp His Glu Thr Glu

465 470 475 480

Ile Gly Gln Asn Cys Val Gln Asn Val Leu Ser

485

490

<213> Human papillomavirus type 16

<400> 4

Arg Pro Ile Pro Lys Pro Ser Pro Trp Ala Pro Lys Lys His Arg Arg
1 5 10 15

Leu Ser Asp Gln Asp Ser Gln Thr Pro

20 25

<210> 5

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 5

Met Ala Asp Pro Ala Ala Ala Thr

1 5

<210> 6

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 6

Ala Asp Pro Ala Ala Ala Thr Lys

1

5

<210> 7

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 7

Asp Pro Ala Ala Ala Thr Lys Tyr

1

5

<210> 8

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 8

Pro Ala Ala Ala Thr Lys Tyr Pro

1

5

<210> 9

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 9

Ala Ala Ala Thr Lys Tyr Pro Leu

1

5

<210> 10

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 10

Ala Ala Thr Lys Tyr Pro Leu Leu

1

5

<210> 11

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 11

Ala Thr Lys Tyr Pro Leu Leu Lys

1

5

<210> 11

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 12

Thr Lys Tyr Pro Leu Leu Lys Leu

1

5

<210> 13

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 13

Lys Tyr Pro Leu Leu Lys Leu Leu

1

5

<210> 14

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 14

Tyr Pro Leu Leu Lys Leu Leu Gly

1

5

<210> 15

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 15

Pro Leu Leu Lys Leu Leu Gly Ser

1

5

<210> 16

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 16

Leu Leu Lys Leu Leu Gly Ser Thr

1

5

<210> 17

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 17

Leu Lys Leu Leu Gly Ser Thr Thr

1

5

<210> 18

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 18

Lys Leu Leu Gly Ser Thr Trp Pro

1

5

<210> 19

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 19

Leu Leu Gly Ser Thr Trp Pro Thr

1

5

<210> 20

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 20

Leu Gly Ser Thr Trp Pro Thr Thr

1

5

<210> 21

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 21

Gly Ser Thr Trp Pro Thr Thr Pro

1

5

21

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 22

Ser Thr Trp Pro Thr Thr Pro Pro

1

5

<210> 23

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 23

Thr Trp Pro Thr Thr Pro Pro Arg

1

5

<210> 24

<220> 24

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 24

Trp Pro Thr Thr Pro Pro Arg Pro

1

5

<210> 25

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 25

Trp Pro Thr Thr Pro Pro Arg Pro Ile

1

5

<210> 25

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 26

Thr Thr Pro Pro Arg Pro Ile Pro

1

5

<210> 27

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 27

Thr Pro Pro Arg Pro Ile Pro Lys

1

5

<210> 28

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 28

Pro Pro Arg Pro Ile Pro Lys Pro

1

5

<210> 29

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 29

Pro Arg Pro Ile Pro Lys Pro Ser

1

5

<210> 30

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 30

Arg Pro Ile Pro Lys Pro Ser Pro

1

5

<210> 31

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 31

Pro Ile Ile Lys Pro Ser Pro Trp

<210> 31

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 32

Ile Pro Lys Pro Ser Pro Trp Ala

1

5

<210> 33

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 33

Pro Lys Pro Ser Pro Trp Ala Pro

1

5

<210> 34

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 34

Lys Pro Ser Pro Trp Ala Pro Lys

1

5

<210> 35

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 35

Pro Ser Pro Trp Ala Pro Lys Lys

1

5

<210> 36

5220

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 36

Ser Pro Trp Ala Pro Lys Lys His

1 5

<210> 37

<211> 8

<212> FRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 37

Pro Trp Ala Pro Lys Lys His Arg

! 11

210 - 33

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 38

Trp Ala Pro Lys Lys His Arg Arg

1

5

<210> 39

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 39

Ala Pro Lys Lys His Arg Arg Leu

1

5

<210> 40

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 40

Pro Lys Lys His Arg Arg Leu Ser

1

5

<210> 41

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 41

Lys Lys His Arg Arg Leu Ser Ser

:

;

<210> 42

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 42

Lys His Arg Arg Leu Ser Ser Asp

1

5

<210> 43

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 43

His Arg Arg Leu Ser Ser Asp Gln

1

5

<210> 44

<220>

<213> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 44

Arg Arg Leu Ser Ser Asp Gln Asp

1

5

<210> 45

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 45

Arg Leu Ser Ser Asp Gln Asp Gln

;

;

<210> 46

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 46

Leu Ser Ser Asp Gln Asp Gln Ser

1

5

<210> 47

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 47

Ser Ser Asp Gln Asp Gln Ser Gln

:

5

<210> 48

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 48

Ser Asp Gln Asp Gln Ser Gln Thr

1

5

<210> 49

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 49

Asp Gln Asp Gln Ser Gln Thr Pro

:

5

<210> 50

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 50

Gln Asp Gln Ser Gln Thr Pro Glu

1

5

<210> 51

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 51

Asp Asn Ser Gln Thr Pro Glu Thr

;

;

<210> 51

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 52

Gln Ser Gln Thr Pro Glu Thr Pro

1 5

<210> 53

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 53

Ser Gln Thr Pro Glu Thr Pro Ala

1 5

<210> 54

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 54

Gln Thr Pro Glu Thr Pro Ala Thr

1

5

<210> 55

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 55

Thr Pro Glu Thr Pro Ala Thr Pro

;

;

<110> 56

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 56

Pro Glu Thr Pro Ala Thr Pro Leu

1

5

<210> 57

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 57

Glu Thr Pro Ala Thr Pro Leu Ser

1 2 3 4 5 6 7 8

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 58

Thr Pro Ala Thr Pro Leu Ser Cys

1

5

<210> 59

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 59

Pro Ala Thr Pro Leu Ser Cys Cys

1

5

<210> 60

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 60

Ala Thr Pro Leu Ser Cys Cys Thr

1

5

<210> 61

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 61

Thr Pro Leu Ser Cys Cys Thr Glu

1

5

<210> 62

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 62

Pro Leu Ser Cys Cys Thr Glu Thr

1

5

<210> 63

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 63

Leu Ser Cys Cys Thr Glu Thr Gln

;

;

<210> 64

<211> 9

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 64

Ser Cys Cys Thr Glu Thr Gln Trp

1

5

<210> 65

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 65

Cys Cys Thr Glu Thr Gln Trp Thr

1

5

<210> 66

<211> 9

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 66

Cys Thr Glu Thr Gln Trp Thr Val

1

5

<210> 67

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 67

Thr Glu Thr Gln Trp Thr Val Ieu

1

5

<210> 68

<211> 9

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 68

Glu Thr Gln Trp Thr Val Leu Gln

1

5

<210> 69

<211> 3

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 69

Thr Gln Trp Thr Val Leu Gln Ser

;

;

<210> 70

;

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 70

Gln Trp Thr Val Leu Gln Ser Ser

1

5

<210> 71

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 71

Trp Thr Val Leu Gln Ser Ser Leu

;

;

<210> 72

<211> 8

;

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 72

Thr Val Leu Gln Ser Ser Leu His

1

5

<210> 73

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 73

Val Leu Gln Ser Ser Leu His Leu

:

:

<210> 74

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 74

Leu Gln Ser Ser Leu His Leu Thr

1

5

<210> 75

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 75

Gln Ser Ser Leu His Leu Thr Ala

<210> 75

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 76

Ser Ser Leu His Leu Thr Ala His

1

5

<210> 77

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 77

Ser Leu His Leu Thr Ala His Thr

1

5

<210> 78

. 220 .

• 223 • Description of Artificial Sequence: synthetic
octapeptide antigen

400, 73

His Leu Thr Ala His Thr Lys Asp

1

5

<210> 79

211 8

<212> PRT

«213» Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

- 400 - 79

His Leu Thr Ala His Thr Lys Asp

1

71

2000-01-02

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 80

Leu Thr Ala His Thr Lys Asp Gly

1

5

<210> 81

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 81

Thr Ala His Thr Lys Asp Gly Leu

1

5

<210> 81

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 82

Ala His Thr Lys Asp Gly Leu Thr

1

5

<210> 83

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 83

His Thr Lys Asp Gly Leu Thr Val

1

5

<220> 84

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 84

Thr Lys Asp Gly Leu Thr Val Ile

1

5

<210> 85

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 85

Lys Asp Gly Leu Thr Val Ile Val

© 2014 Cengage

• 220 •

• 223 • Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 86

Asp Gly Leu Thr Val Ile Val Thr

1

5

<210> 87

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 87

Gly Leu Thr Val Ile Val Thr Leu

;

• 219 • 88

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 88

Leu Thr Val Ile Val Thr Leu His

1

5

<210> 89

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
octapeptide antigen

<400> 89

Thr Val Ile Val Thr Leu His Pro

1

2

<210> 90

<400> 90

Met Ala Asp Pro Ala Ala Ala Thr Lys Tyr Pro Leu Leu Lys Leu Leu

1

5

10

15

Gly Ser Thr Trp Pro Thr Thr Pro Pro Arg Pro Ile Pro Lys Pro Ser

20

25

30

Pro Trp Ala Pro Lys Lys His Arg Arg Leu Ser Ser Asp Gln Asp Gln

35

40

45

Ser Gln Thr Pro Glu Thr Pro Ala Thr Pro Leu Ser Cys Cys Thr Glu

50

55

60

Thr Gln Trp Thr Val Leu Gln Ser Ser Leu His Leu Thr Ala His Thr

65

70

75

80

Lys Asp Gly Leu Thr Val Ile Val Thr Leu His Pro

85

90

<210> 91

<211> 126

<212> PRT

<213> Human papillomavirus

1 5 10 15

Thr Pro Thr Thr Gln Pro Tyr Pro Arg Val Thr Pro Pro Ser Asn Arg

20 25 30

Arg Pro Ser Thr Thr Pro Asn Ser Gln Asp Arg Gly Arg Pro Arg Arg

35 40 45

Ser Asp Lys Asp Ser Arg Lys His Leu Tyr Ala Asp Gly Leu Thr Asp

50 55 60

Gly Glu Asp Pro Glu Val Pro Glu Val Glu Asp Glu Glu Lys Glu Asn

65 70 75 80

Gln Arg Pro Leu Gly His Pro Asp Leu Ser Leu Leu Arg Glu Thr Leu

85 90 95

Glu Val Tyr Thr Gln Arg Leu Lys Arg Asp Ile Leu Gln Gln Asp Leu

100 105 110

Asp Asp Phe Cys Arg Lys Leu Gly Ile His Pro Thr Ser Val

115 120 125

1210 . 70

<220>

<223> Description of Artificial Sequence:HPV E4

Consensus Amino Acid Sequence

<400> 92

Met Ala Asp Ala Pro Thr Gln Tyr Pro Leu Leu Lys Leu Leu Pro Pro

1 5 10 15

Thr Pro Thr Pro Pro Pro Arg Pro Pro Pro Pro Pro Pro Pro Pro Arg

20 25 30

Pro Trp Ala Gly Pro Lys Lys Pro Thr Arg Gly Pro Pro Arg Arg Arg

35 40 45

Arg Leu Glu Ser Asp Ser Asp Asp Ser Gly Glu Val Glu Pro Thr Pro

50 55 60

Thr Thr Pro Pro Ala Pro Pro Thr Gly Asp Glu Glu Val Glu Pro Pro

65 70 75 80

Trp Thr Val Asn Thr Leu Leu Ser Ser Val Thr Leu Thr Trp Glu Tyr

85 90 95

Thr Phe Asp Gly Leu Val Val Ile Val Asn Asp Leu Glu Asp Tyr Trp

<210> 93

<211> 49

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HPV E4 protein

consensus amino acid sequence, amino acids 27-73.

<400> 93

Pro Pro Pro Pro Pro Arg Pro Trp Ala Gly Pro Lys Lys Pro Thr Arg

1

5

10

15

Gly Pro Pro Arg Arg Arg Arg Leu Glu Ser Asp Ser Asp Ser Asp Ser

20

25

30

Gly Glu Val Glu Gly Pro Thr Pro Thr Thr Pro Pro Ala Pro Pro Thr

35

40

45

GLY

<212> PPT

<213> Human papillomavirus type 54

<400> 94

His His Val Pro Thr Thr Pro Gln Lys Gln Ser Arg Ala Arg Arg Arg

1

5

10

15

Leu Glu Asn Glu Leu Glu Ser Thr Ala Gln Thr Ser Asn His Thr Ala

20

25

30

Pro Gln Thr

35

<210> 95

<211> 48

<212> PRT

<213> Human papillomavirus type 32

<400> 95

Pro Ser Gln Gly Val Thr Ala Thr Thr Ala Gln Thr Glu Tyr Tyr Thr

1

5

10

15

Lys Thr Pro Pro Arg Pro Pro Arg Arg Glu Asn Asp Thr Asp Ser Leu

20

25

30

<210> 96

<211> 50

<212> PRT

<213> Human papillomavirus type 42

<400> 96

Pro Leu Thr Thr Thr Gln Thr Val Gln Thr Glu Gln His Thr Thr

1

5

10

15

Cys Pro Ser Lys Pro His Arg His Glu Asn Asp Thr Asp Ser Val Asp

20

25

30

Ser Arg His His Ser Thr Cys Ser Thr Gln Thr Pro Ala Ser Pro Ala

35

40

45

Ser Pro

50

<210> 77

<400> 97

Lys Pro Arg Trp Ala Arg Pro Lys Asp Arg Ser Lys Ser Asp Ser Asp

1

5

10

15

Ser Arg Arg Ser Thr Gly Ser Ser Ser Ser Asn Ser Ser Ser Asn Ser

20

25

30

Asn Ser Asn Asn Ile Pro Lys Pro Pro Pro Arg Lys Pro Leu Asn

35

40

45

<210> 98

<211> 39

<212> PRT

<213> Human papillomavirus type 28

<400> 98

Lys Pro Arg Trp Ala Arg Pro Lys Asp Arg Ser Lys Asn Asp Ser Asp

1

5

10

15

Ser Arg His Ser Thr Gly Ser Ser Ser Ser Asp Ser Thr Pro Lys Ile

20

25

30

Pro Pro Arg Lys Pro Leu Asn

<210> 99

<211> 40

<212> PRT

<213> Human papillomavirus type 10

<400> 99

Lys Pro Arg Trp Ala Arg Pro Arg Asp Arg Asn Lys Ser Asp Ser Asp

1

5

10

15

Ser Arg Arg Ser Thr Asp Ser Thr Ser Ser Ser Asp Lys Gly Pro Lys

20

25

30

Ile Pro Pro Arg Arg Pro Arg Asn

35

40

<210> 100

<211> 51

<212> PRT

<213> Human papillomavirus type 29

<400> 100

Lys Pro Arg Trp Gly Leu Arg Arg Asp Arg Arg Gly Asn Asp Ala Gly

1

5

10

15

Leu Lys Glu Ser Gly Leu Gly His Ser Ser Ser Ser Ser Ser Ser Thr

Ser Ser Ser Ser Asn Arg Pro Arg Pro Thr Pro Pro Pro Arg Lys

35

40

45

Pro Val His

50

<210> 101

<211> 41

<212> PRT

<213> Human papillomavirus type 61

<400> 101

Pro Pro Arg Ala Trp Ala Pro Pro Arg His Pro Pro Arg Cys Arg Arg

1

5

10

15

Arg Leu Ile Ser Asp Ser Asp Ser Thr Glu Thr Glu Ser Ser Ser Pro

20

25

30

Thr Gln His Lys Lys Thr Thr Thr Ser

35

40

<210> 102

<211> 45

<212> PPT

<400> 102

Gln Glu Glu Gln Leu Arg Pro Pro Lys Arg Cys Ala Pro Pro Arg Arg

1

5

10

15

Gln Arg Val Arg Arg Pro Ser Ala Ser Val Ser Ser Asp Ser Ser

20

25

30

Ile Pro Gly Pro Thr Leu Arg Glu Arg Ser Glu Arg Gly

35

40

45

<210> 103

<211> 45

<212> PRT

<213> Human papillomavirus type 27

<400> 103

Glu Gln Glu Gln Leu Arg Pro Gln Thr Cys Cys Ala Pro Pro Arg Arg

1

5

10

15

His Arg Val Arg Arg Pro Ser Ala Ser Gly Ser Ser Ser Asp Ser Ser

20

25

30

Ile Ser Gly Pro Thr Leu Arg Glu Arg Ser Glu Arg Gly

35

40

45

<211> 41

<212> PRT

<213> Human papillomavirus type 57

<400> 104

Gln Ser Arg Pro His Ser Arg Thr Pro Pro Arg Arg His Arg Val Arg

1

5

10

15

His Pro Ser Ala Ser Gly Ser Ser Asp Ser Ser Gly Asn Ser Pro

20

25

30

Thr Leu Arg Gly Arg Ser Glu Lys Gly

35

40

<210> 105

<211> 39

<212> PRT

<213> Human papillomavirus type 26

<400> 105

Pro Thr Cys Pro Trp Ala Pro Arg Lys Pro Arg Arg His Thr Thr Ala

1

5

10

15

Ser Asp Asp Asp Ser Val Asp Leu Thr Pro Pro Ser Pro Gln Ser Pro

20

25

30

<210> 106

<211> 40

<212> PRT

<213> Human papillomavirus type 30

<400> 106

Pro Pro Arg Pro Trp Ala Pro Thr Lys Pro Arg Pro Pro His Gly Arg

1

5

10

15

Glu Asn Val Leu Glu Pro Gln Ser Pro Thr Val Gln Thr Pro Pro Asp

20

25

30

Ser Pro Leu Pro Glu Ser Pro Thr

35

40

<210> 107

<211> 40

<212> PRT

<213> Human papillomavirus type 53

<400> 107

Pro Pro Arg Pro Trp Ala Pro Thr Lys Pro His His Pro Cys Thr Asp

Glu Asn Val Pro Glu Pro Gln Ser Pro Thr Val Leu Thr Pro Pro His

20

25

30

Ser Pro Leu Pro Gln Pro Glu Ser

35

40

<210> 108

<211> 39

<212> PRT

<213> Human papillomavirus type 56

<400> 108

Pro Pro Pro Arg Pro Trp Ala Thr Lys Thr Pro Gln Tyr Pro Thr Asp

1

5

10

15

Gln Glu Asn Asp Pro Asp Tyr Gly Asn Gln Asn Leu Thr Pro Pro Glu

20

25

30

Ser Pro Thr Gln Ser Val Ser

35

<210> 109

<211> 37

<212> PPT

<400> 109

Pro Pro Leu Trp Ala Pro Lys Thr Pro Arg Tyr Pro Thr Asp Gln Glu

1

5

10

15

Asn Asp Pro Glu Gln Val Asn Gln Asn Leu Thr Pro Pro Glu Ser Pro

20

25

30

Thr His Thr Val Ser

35

<210> 110

<211> 29

<212> PRT

<213> Human papillomavirus type 18

<400> 110

Ala Pro Cys Pro Trp Ala Pro Gln Arg Pro Thr Ala Arg Arg Arg Leu

1

5

10

15

Leu His Asp Leu Asp Thr Val Asp Ser Arg Arg Ser Ser

20

25

<210> 111

<211> 31

<212> PRT

<400> 111

Lys Pro His Pro Trp Ala Pro Gln Asn Pro Thr Ser Arg Arg Arg Leu

1

5

10

15

Leu Ser Asp Leu Asp Ser Val Asp Ser Gln Ser Ser Thr Thr Asp

20

25

30

<210> 112

<211> 32

<212> PRT

<213> Human papillomavirus type 39

<400> 112

Pro Gln Gln Pro His Ala Pro Lys Lys Gln Ser Arg Arg Arg Leu Glu

1

5

10

15

Ser Asp Leu Asp Ser Val Gln Ser Gln Ser Pro Leu Ser Pro Thr Glu

20

25

30

<210> 113

<213> Human papillomavirus type 70

<400> 113

Pro Gln Gln Pro His Ala Pro Lys Lys Leu Ser Arg Arg Arg Leu Ala

1

5

10

15

Ser Val Glu Ser Pro Asp Pro Gln Lys Gln Thr

20

25

<210> 114

<211> 32

<212> PRT

<213> Human papillomavirus type 59

<400> 114

Lys Pro Arg Thr Trp Ala Pro Lys Arg Gly Thr Val Arg Arg Arg Leu

1

5

10

15

Glu Ser Asp Gln Asp Ser Val Asp Thr His Ser Thr Leu Ser Leu Pro

20

25

30

<212> PRT

<213> Human papillomavirus type 7

<400> 115

Pro Pro Thr Pro Pro Arg Cys Thr Thr Pro Pro Thr Pro Cys Pro Arg

1

5

10

15

Arg Pro Pro Lys Tyr Thr Thr Ala Thr His Arg Pro Glu Ser Glu

20

25

30

Gly Glu Thr Glu Thr Cys Pro Ser Val Gln Trp Thr Asp Val

35

40

45

<210> 116

<211> 41

<212> PRT

<213> Human papillomavirus type 40

<400> 116

Pro Thr Pro Pro Thr Pro Pro Gln Arg Pro Pro Lys Arg Ser Ala

1

5

10

15

Pro Pro Arg His Arg Pro Glu Ser Asp Glu Glu Thr Asp Thr Cys Pro

20

25

30

<210> 117

<211> 35

<212> PRT

<213> Human papillomavirus type 16

<400> 117

Lys Pro Ser Pro Trp Ala Pro Lys Lys His Arg Arg Leu Ser Ser Asp

1

5

10

15

Gln Asp Gln Ser Gln Thr Pro Glu Thr Pro Ala Thr Pro Leu Ser Cys

20

25

30

Cys Thr Glu

35

<210> 118

<211> 34

<212> PPT

<213> Human papillomavirus type 35

<400> 118

Lys Pro Ala Pro Trp Ala Pro Gln Lys Pro Arg Arg Gln Ile Thr Asn

1

5

10

15

20

25

30

Asp Ser

<210> 119

<211> 39

<212> PRT

<213> Human papillomavirus type 31

<400> 119

Lys Pro Ala Pro Trp Ala Pro Val Lys Val Cys Gly Gly Arg Arg Arg

1

5

10

15

Leu Leu Ser Asp Gln Glu Gln Ser Gln Ser Thr Glu Thr Pro Thr Thr

20

25

30

Pro Thr Ser Cys Cys Glu Ala

35

<210> 119

<211> 38

<212> PRT

<213> Human papillomavirus type 52

Pro Gln Cys Pro Trp Val Pro Lys Thr His Thr Tyr Asn His His Arg

1

5

10

15

Asn Asp Asp Asp Gln Thr Ser Gln Thr Pro Glu Thr Pro Ser Thr Pro

20

25

30

Thr Thr Phe Cys Gly Asp

35

<210> 121

<211> 26

<212> PRT

<213> Human papillomavirus type 33

<400> 121

His His Lys Gln Arg Pro Asn Asp Asp Asp Leu Gln Thr Pro Gln Thr

1

5

10

15

Pro Pro Ser Pro Leu Gln Ser Cys Ser Val

20

25

<210> 122

<211> 32

<212> PPT

<400> 122

Pro Thr Thr Lys Val His Arg Gly Gln Ser Asp Asp Asp Ser Ile Tyr

1

5

10

15

Gln Thr Pro Glu Thr Thr Pro Ser Thr Pro Gln Ser Ile Gln Thr Ala

20

25

30

<210> 123

<211> 29

<212> PRT

<213> rhesus monkey papillomavirus

<400> 123

Pro Thr Pro Ala Pro Arg Lys Thr Cys Gly His Arg Leu Gln Ser Glu

1

5

10

15

Cys Val Gly Gln Thr Gln Val Glu Ile Gln Cys Gly Pro

20

25

<210> 124

<211> 36

<400> 124

Pro Leu Cys Pro Gln Ala Pro Arg Lys Thr Gln Cys Lys Arg Arg Leu

1

5

10

15

Gly Asn Glu His Glu Glu Ser Asn Ser Pro Leu Ala Thr Pro Cys Val

20

25

30

Trp Pro Thr Leu

35

<210> 125

<211> 34

<212> PRT

<213> Human papillomavirus type 11

<400> 125

Leu Gln Cys Pro Pro Ala Pro Arg Lys Thr Ala Cys Arg Arg Arg Leu

1

5

10

15

Gly Ser Glu His Val Asp Arg Pro Leu Thr Thr Pro Cys Val Trp Pro

20

25

30

Thr Ser

<210> 126

<211> 40

<212> PRT

<213> Human papillomavirus type 44

<400> 126

His Arg Pro His Pro His Cys Pro Leu Ala Pro Pro Arg Thr Ala Trp

1

5

10

15

Thr Arg Arg His Val Asn Asp Pro Glu Asp Pro Pro Gln Thr Pro Thr

20

25

30

Thr Pro Glu Thr Pro Ser Val Ser

35

40

<210> 127

<211> 40

<212> PRT

<213> Human papillomavirus type 55

<400> 127

His Arg Pro His Leu His Cys Pro Pro Ala Pro Pro Arg Asn Ala Trp

1

5

10

15

Thr Arg Arg His Val Asn Asp Pro Glu Asp Pro Pro Gln Thr Pro Thr

Thr Pro Gly Thr Pro Ser Val Ser

35

40

<210> 128

<211> 39

<212> PRT

<213> Human papillomavirus type 13

<400> 128

Pro Gin Cys Pro Ala Ala Pro Arg Lys Asn Val Cys Lys Arg Arg Leu

1

5

10

15

Val Asn Asp Asn Glu Asp Leu His Val Pro Leu Glu Thr Pro Arg Thr

20

25

30

His Lys Ala Leu Cys Val Ser

35

<210> 129

<211> 40

<212> PRT

<213> Pygmy chimpanzee papillomavirus

<400> 129

Pro Ile Asn Asp Phe Glu Asp Pro Pro Thr Val Leu Glu Asn Ser Lys

20

25

30

Thr Pro Leu Thr Leu Cys Val Pro

35

40

<210> 130

<211> 22

<212> PRT

<213> Human papillomavirus type 34

<400> 130

Ala Thr His Arg Thr Arg Val Cys Gln His Gly Asn Gly Ile Asp Ser

1

5

10

15

Val Thr Gln Thr Arg Gly

20

<210> 131

<211> 21

<212> PRT

<213> Human papillomavirus type 19

1 5 10 15

Ala Arg Asn Asp Gln Gly Pro Asn Pro Ser Pro Gly Arg Gly Arg Gly

20 25 30

Arg Gly Leu Phe Arg Leu Thr Gly Asp His Asp Pro Asn Pro Glu Glu

35 40 45

Arg Pro Pro Pro Leu Glu Gly Glu Val Glu Gly His Pro Pro Pro Pro

50 55 60

Val Thr Asn Pro Pro Gly His

65 70

<210> 132

<211> 95

<212> PRT

<213> Human papillomavirus type 25

<400> 132

Pro Pro Ala Gly His Asp Asp Ser Lys Pro Lys Arg Ala Arg Gly Asp

1 5 10 15

Gln Gly Pro Ser Pro Gly Pro Gly Pro Ser Pro Ala Pro Val Ser Asp

20 25 30

35

40

45

Asp Gln Asp Pro Asp Pro Glu Glu Lys Pro Gln Pro Glu Gly Glu Val

50

55

60

Gln Gly His Pro Gln Pro Pro Val Thr Glu Pro Gln Gly His Leu

65

70

75

80

Pro Pro Pro Pro Leu Pro Pro Asn Gly His Asn Asp Arg Asp

85

90

95

<210> 133

<211> 99

<212> PRT

<213> Human papillomavirus type 20

<400> 133

Gly Thr Asp Gly Asp Leu Pro Val Gly Gln Gly Glu Gln Pro Lys Arg

1

5

10

15

Ala Arg Gly Asp Gly Pro Gly Gln Ser Pro Ser Pro Ser Pro Gly Arg

20

25

30

Gly Arg Gly Arg Gly Thr Gly Leu Gly Leu Gly Leu Asn Arg

35

40

45

50

55

60

Ser Pro Ser Ala Pro Leu Pro Pro Pro Pro Gln Pro Pro Pro Asp Gly

65

70

75

80

Gln Val Glu Gly His Pro Pro Pro Pro Pro Pro His Asn Gly

85

90

95

Arg Asp Ser

<210> 134

<211> 106

<212> PRT

<213> Human papillomavirus type 21

<400> 134

Gly Thr Asp Gly Asp Arg Pro Val Gly Pro Gly Glu Arg Pro Lys Arg

1

5

10

15

Ile Lys Gly Gly Asp Arg Ile Pro Ser Pro Gly Arg Gly Arg Gly Arg

20

25

30

Gly Arg Gly Ser Asp Pro Asp Pro Gly Pro Asp Pro Gly Pro Ile Pro

35

40

45

50

55

60

Glu Gly Lys Cys Pro Ser Ser Leu Pro Pro Pro Pro Pro Pro Pro

65

70

75

80

Gln Pro Thr Thr Pro Pro Glu Gly Gln Gly Glu Gly His Pro Pro Pro

85

90

95

Pro Pro Pro Pro Pro Asn Gly His Asp Gly

100

105

<210> 135

<211> 88

<212> PRT

<213> Human papillomavirus type 14

<400> 135

Glu Gly Thr Asp Ala Asp Arg Pro Val Gly Pro Gly Glu Arg Pro Lys

1

5

10

15

Arg Gly Arg Gly Gly Asp Arg Gly Pro Ser Pro Gly Arg Gly Arg Gly

20

25

30

Arg Gly Leu Gly Ser Asp Leu Asp Pro Gly Arg Asn Arg Leu Ser Gly

35

40

45

50

55

60

Glu Ser Gln Pro Pro Pro Glu Gly Glu Val Glu Gly His Pro Pro Pro

65

70

75

80

Pro Pro Asn Gly His Asn Gly His

85

<210> 136

<211> 90

<212> PRT

<213> Human papillomavirus type 5

<400> 136

Ser Gln Gly Asp Arg Lys Arg Ser Lys Gly Asp Gln Gly Pro Asp Thr

1

5

10

15

Gly Pro Gly Leu Gly Pro Gly Arg Gly Pro Ser Pro Lys Pro Thr Pro

20

25

30

Leu Gly Pro Pro Pro Gly Pro Gly Pro Arg Arg Ile Pro Arg Leu Gly

35

40

45

Pro Leu Gln Ala Asp Arg Asp Pro Glu Glu Gly Pro Gln Pro Pro Ala

50

55

60

65

70

75

80

Pro Pro Pro Pro Ala Pro His Asn Gly His

85

90

<210> 137

<211> 87

<212> PRT

<213> Human papillomavirus type 36

<400> 137

Gly Gln Gly Asp Arg Lys Arg Ser Lys Gly Asp Gln Gly Pro Asp Thr

1

5

10

15

Asp Pro Leu Gly Pro Asp Arg Gly Pro Ser Pro Gly Pro Thr Pro Gln

20

25

30

Pro Leu Gly Leu Pro Pro Gly Leu Gly Pro Arg Arg Ser Pro Arg

35

40

45

Leu Gly Ser Ser Gly Tyr Gln Pro Asp His Asp Pro Glu Ala Pro Ile

50

55

60

Glu Gly Glu Val Glu Gly Gly His Gly His His Pro Pro Pro Pro

65

70

75

80

80

<210> 138

<211> 87

<212> PRT

<213> Human papillomavirus type 47

<400> 138

Gln Gly Asp Arg Lys Arg Thr Lys Gly Asp Pro Asp Pro Asp Pro Gly

1

5

10

15

Arg Gly Pro Val Leu Lys Pro Thr Leu Pro Pro Pro Pro Pro Pro

20

25

30

Pro Thr Gly Pro Gly Leu Arg Arg Ser Thr Arg Leu Val Leu Val Pro

35

40

45

Gly Gln Gly Pro Pro Asp Leu Pro Ala Pro Pro Val Glu Gly Glu

50

55

60

Val Glu Gly His Pro Gln Gly Lys Asp Arg Asp His Pro Pro Pro Thr

65

70

75

80

Pro Gln Asn Gly His Gly Lys

<210> 139

<211> 76

<212> PRT

<213> Human papillomavirus type 12

<400> 139

Gly Asp Arg Lys Arg Ser Lys Gly Asp Gln Gly Arg Asp Thr Ala Pro

1

5

10

15

Ser Leu Thr Pro Gly Arg Ala Pro Ser Pro Lys Pro Gly Pro Leu Ala

20

25

30

Pro Pro Pro Tyr Pro Gly Pro Pro Gly Pro Arg Arg Ser His Arg Leu

35

40

45

Gly Thr Gly Gly Arg Asp Arg Asn Pro Glu Glu Gly Gly Val Glu Gly

50

55

60

His Pro Pro Thr Pro Pro Leu Ser Gly Gly Asp Pro

65

70

75

<210> 140

<211> 91

<212> PRT

<213> Human papillomavirus type 9

Gln Asp Arg Lys Lys Ser Arg Gly Asp Gln Gly Arg Asp Thr Ala Pro

1

5

10

15

Gly Leu Ala Pro Gly Arg Ser Pro Gly Leu Gly Pro Leu Ala Pro Pro

20

25

30

Pro Tyr Pro Gly Pro Gly Pro Arg Arg Ser Pro Arg Gln Phe Gly Pro

35

40

45

Gly Pro Asp Arg Asp Pro Glu Asp Gly Leu Gln Pro Pro Leu Gly Glu

50

55

60

Gly Gln Val Glu Gly His Pro Gly Asp Gly Asp Gln Pro Gln Gly His

65

70

75

80

Pro Pro Pro Thr Pro Ser Asn Gly His Lys Gly

85

90

<210> 141

<211> 70

<212> PPT

<213> Human papillomavirus type 11

<400> 141

Pro Leu Thr Pro Asp Ala Asp Asp Asp Pro Arg Pro Thr Pro Asp Asp

Lys Gly Asp Glu His Gly Pro Ala Pro Gly Arg Ala Ala Ala Pro Leu

20 25 30

Lys Leu Asp Leu Asp Pro Pro Gln Gly Gly Pro Asp Gln Pro Pro Gly

35 40 45

Ala Thr Gly Gly Val Gly Glu Thr Pro Pro Glu Gly Asn Glu Glu Ser

50 55 60

Gln Pro Pro Pro Gly Glu

65 70

<210> 142

<211> 61

<212> PRT

<213> Human papillomavirus type 15

<400> 142

Thr Thr Glu Lys Asn Leu Ala Gln Pro Pro Pro Pro Gly Gly Arg Lys

1 5 10 15

Asp Lys Asp Lys Asp Lys Lys Thr Ala Gln Gly Asp Gln Gly Pro Pro

20 25 30

Gln Gly Gly Asp Lys Lys Ser Pro Gly Gln Gly Thr Pro Ala Ser Thr

Asp Asp Pro Glu Lys Pro Pro Ser Pro Pro Pro Gly Glu

50

55

60

<210> 143

<211> 60

<212> PRT

<213> Human papillomavirus type 17

<400> 143

Asp Thr Gly Gly Lys Arg Leu Ala Leu Gln Pro Pro Pro Pro Gly Thr

1

5

10

15

Lys Asp Lys Thr Ser Asp Asp Gln Gly Pro Pro His Gly Gly Asp Lys

20

25

30

Gln Ser Pro Gly Glu Gly Ser Asp Ala Ser Gly Asp Glu Asn Ala Pro

35

40

45

Thr Pro Glu Thr Pro Gln Asp Pro Pro Thr Gly Glu

50

55

60

<210> 144

<211> 62

<212> PRT

<400> 144

Glu Glu Lys His Leu Ala Leu Gln Pro Pro Pro Pro Gly Lys Lys Asp

1

5

10

15

Lys Glu Lys Thr Pro Gln Gln Gly Asp Gln Gly Pro Pro Pro Gly Gly

20

25

30

Asn Lys Gln Pro Pro Gly Glu Gly Thr Asp Ala Asp Gly Asp Glu Asn

35

40

45

Ala Pro Thr Pro Glu Thr Pro Pro Val Pro Pro Thr Gly Glu

50

55

60

<210> 145

<211> 61

<212> PRT

<213> Human papillomavirus type 9

<400> 145

Pro Pro Pro Gly Arg Lys Asp Arg Asp Lys Glu Lys Glu Lys Glu Lys

1

10

15

Glu Lys Glu Lys Lys Pro Thr Thr Gly Asp Lys Gly Pro Asp Pro Arg

20

25

30

Pro Pro Pro Gln Thr Pro Leu Pro Pro Pro Thr Gly Glu

50 55 60

<210> 146

<211> 57

<212> PRT

<213> Human papillomavirus type 22

<400> 146

Leu Val Leu Gln Ser Pro Pro Ser Gly Gly Lys Lys Gly Glu Arg Asp

1 5 10 15

Lys Asp Lys Lys Pro Gln Gln Gly Glu Glu Lys Pro Asp Gln Gly Pro

20 25 30

Glu Ala Pro Ser Ser Gly Glu Gly Pro Pro Asp Asp Pro Ser Pro

35 40 45

Glu Asn Pro Gln Asn Pro Pro Gly Gly

50 55 60

<210> 147

<211> 58

<400> 147

Lys His Leu Ala Leu Gln Pro Pro Pro Gly Gly Lys Lys Asp Lys Glu

1

5

10

15

Lys Lys Pro Ser Pro Gly Glu Glu Lys Pro Asp Gln Gly Pro Gly Ala

20

25

30

Glu Ser Asn Gly Gly Gly Lys Pro Lys Asp Pro Pro Pro Glu Glu

35

40

45

Pro Gln Asn Pro Pro Gly Gly

50

55

<210> 148

<211> 63

<212> PRT

<213> Human papillomavirus type 38

400 + 148

Asp Thr Gly Glu Lys His Leu Ala Leu Gln Pro Pro Ala Gly Lys

1

5

10

15

Gly Lys Asp Lys Glu Lys Pro Gln Ala Pro Lys Gly Glu Glu Lys Ala

20

25

30

35

40

45

Pro Pro Pro Glu Asp Pro Gln Ser Pro Pro Pro Gly Glu Gly Glu

50

55

60

<210> 149

<211> 75

<212> PRT

<213> Human papillomavirus type 49

<400> 149

Thr Leu Val Leu Gln Gln Pro Pro Thr Pro Gly Lys Arg Ser Arg Asp

1

5

10

15

Asp Asp Pro Gly Leu Glu Pro Gly Pro Ala Asp Gly Lys Arg Ala Pro

20

25

30

Gln Gly Pro Lys Lys Pro Ala Val Pro Asp Pro Asp Pro Asp Pro Leu

35

40

45

Pro Glu Asp Pro Glu Gly Pro Gln Asp Leu Ser Gln Pro Pro Glu Ile

50

55

60

Pro Ala Pro Arg Glu Pro Ala Gly Ala Glu Gly

65

70

75

<210> 150

<211> 52

<212> PRT

<213> Human papillomavirus type 4

<400> 150

Pro Ser Arg Arg Ala Leu Leu Glu Gly Gly Asn Arg Gly Asn Pro Thr

1

5

10

15

Arg Pro Pro Pro Arg Pro Leu Lys Pro Arg Glu Tyr Asp Tyr Asp Glu

20

25

30

Asp Asp Glu Lys Glu Asn Gln Gly Pro Gly Gln Glu Lys Pro Pro Ala

35

40

45

Lys Glu Glu Glu

50

<210> 151

<211> 54

<212> PPT

<213> Human papillomavirus type 45

<400> 151

Pro Ser Leu Pro Arg Arg Ala Leu Val Val Glu Thr Thr Glu Glu Glu

Leu Asn Arg Pro Pro Gln Arg Pro Pro Lys Pro Arg Gly Tyr Glu Tyr

20

25

30

Asp Glu Asp Asp Asp Lys Glu Asn Gln Gly Pro Gly Gln Glu Arg Pro

35

40

45

Pro Ala Lys Glu Glu Glu

50

<210> 152

<211> 44

<212> PRT

<213> Human papillomavirus type 48

<400> 152

Leu Glu Gly Asp Arg Ala Ser Gln Lys Thr Pro Thr Pro Ser Arg Pro

1

5

10

15

Pro Pro Arg His Pro Asp Tyr Glu Ser Asp Asp Asp Glu Asn Arg Glu

20

25

30

Asn Leu Glu Pro Pro Thr Pro Pro His Pro Glu Asp

35

40

<212> PRT

<213> Human papillomavirus type 50

<400> 153

Ala Asn Arg Lys Asp Leu Glu Ala Val Asn Gln Lys Pro Tyr Arg Thr

1

5

10

15

Pro Asn His Pro Pro Arg His Gln Gln Tyr Asp Phe Asp Glu Asp Asp

20

25

30

Glu Lys Glu Asn Thr Ile Pro Thr Asp Thr Glu Ser His Asn Gln Asn

35

40

45

<210> 154

<211> 47

<212> PRT

<213> Human papillomavirus type 60

<400> 154

Leu Pro Thr Glu Asp Arg Pro His Lys Arg Glu Ser Leu Ala Leu Pro

1

5

10

15

Lys Glu Asn Tyr Pro Pro Glu Ser Arg Pro Val Pro Lys Asp Ala

35

40

45

<210> 155

<211> 39

<212> PFT

<213> Bovine papillomavirus type 1

<400> 155

Pro Ser Leu Ser Leu Leu Cys Ser Ala Pro Pro Pro Ala Val Pro Ser

1

5

10

15

Glu Gln Ala Ser Val Gly Tyr Glu Thr Val Leu Ala Arg Thr Pro Thr

20

25

30

Ile Phe Leu Gln Ala Arg Gly

35

<210> 155

<211> 39

<212> PFT

<213> Unknown

<400> 156

Pro Ser Leu Ser Leu Leu Cys Ser Ala Pro Pro Pro Ala Tyr Pro Ser

1

5

10

15

Glu Gln Ala Ser Val Gly Tyr Glu Thr Val Leu Ala Arg Thr Pro Thr

20

25

30

Ile Phe Leu Gln Ala Arg Gly

35

<210> 157

<211> 43

<212> PRT

<213> European elk papillomavirus

<400> 157

Pro Thr Gln Pro Thr Glu Pro Cys Leu Thr Leu Leu Asp Asn Pro

1

5

10

15

Pro Phe Val Ala Pro Ser Glu Leu Ala Ile Thr Gly Val Gly Pro Phe

20

25

30

Thr Ala Arg Leu Pro Thr Ala His His His Pro

35

40

45

<210> 158

<211> 34

<212> PRT

<213> deer papillomavirus

<400> 158

Thr Leu Leu Leu Glu Ala Thr Pro Phe Thr Val Pro Ser Glu Leu Ala

1

5

10

15

Lys Thr Gly Val Gly Pro Leu Thr Ala Arg Leu Pro Thr Ala His His

20

25

30

Ser Pro

<210> 159

<211> 50

<212> PRT

<213> Bovine papillomavirus type 4

<400> 159

Gly Asp Leu Pro Glu Thr Pro Gly Ala Gly Ser Arg Gly Arg Ser Arg

1

5

10

15

Leu Arg Asp Asp Arg Arg His Tyr His Asp His Glu Glu Glu Glu Glu Glu

Arg Thr Pro Val Asp Glu Thr Arg Gly Tyr Arg Val Pro Gly Asp Pro

35

40

45

Arg Glu

50

<210> 160

<211> 50

<212> PRT

<213> Human papillomavirus type 41

<400> 160

Pro Gln Arg Tyr Tyr Asp Arg Arg Gly Arg Asp Asp Ala Glu Thr Arg

1

5

10

15

Lys Arg Gly Ser Arg Ser Pro Gln Pro Leu Ser Glu Asp Glu Glu Leu

20

25

30

Thr Asp Ala Asp Pro Pro Arg Arg Pro Asn Ala Gly Pro Arg Arg Arg

35

40

45

Leu Phe

50

<212> PRT

<213> Canine oral papillomavirus

<400> 161

Leu Pro Pro Gly Lys Gly Arg His Gly Gly Leu Asp Gly Gly Arg Arg

1

5

10

15

Gly Ser Pro Glu Gly Gln Glu Asp Glu Glu Asp Ser Asp Glu Glu Glu

20

25

30

Ala Glu Asn Tyr Pro Pro Ser Arg Ser Arg Pro Arg Arg Gly Arg

35

40

45

<210> 162

<211> 34

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: cottontail rabbit

papillomavirus

<400> 162

Gln Gly Pro Lys Pro Arg Val His Trp Ala Asp Ile Gly Gln Gly His

1

5

10

15

20

25

30

Thr Lys

<210> 163

<211> 61

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: Rabbit Oral

Papillomavirus

<400> 163

Leu Gln Tyr Pro Gln Ala Pro Arg Thr Ile Arg Lys Pro Arg Ser Ser

1

5

10

15

Arg Tyr Arg Gly Arg Phe Leu Val Thr Asp Gly Gly Asp Pro Asp Pro

20

25

30

Gln Ala Leu Asp Ser Thr Gln Gln Asp Pro Glu Asp Lys Glu Asn Ile

35

40

45

Pro Pro Thr Pro Thr Pro Thr Pro Pro Pro Pro Pro Pro Pro Pro Pro

<210> 164

<211> 48

<212> PPT

<213> Human papillomavirus type 1a

<400> 164

Thr Pro Pro Ser Asn Arg Arg Pro Ser Thr Thr Pro Asn Ser Gln Asp

1

5

10

15

Arg Gly Arg Pro Arg Arg Ser Asp Lys Asp Ser Arg Lys His Leu Tyr

20

25

30

Ala Asp Gly Leu Thr Asp Gly Glu Asp Pro Glu Val Pro Glu Val Glu

35

40

45

<210> 165

<211> 4

<212> PPT

<213> Human papillomavirus type 63

<400> 165

Arg Arg Leu Phe Ala Ser Asp Gly Pro Thr Asp Glu Glu Gly Pro Glu

20

25

30

Val Pro Glu Ile Pro Pro Ser Asp

35

40

<210> 166

<211> 48

<212> PRT

<213> Mastomys natalensis

<400> 166

Ile Pro Arg Val Ser Leu Gln Asp Lys Thr Thr Gly Gly Asn Gln Gln

1

5

10

15

Arg Arg Arg Arg Arg Gly Glu Arg Gly Ala Arg Thr Pro Ser Pro Glu

20

25

30

Thr Thr Ala Gln Arg Pro Lys Arg Pro Arg Arg Ala Cys Thr Arg Lys

35

40

45

<211> 15

<212> PRT

<213> Human papillomavirus type 16

<400> 167

Arg Pro Ile Pro Lys Pro Ser Pro Trp Ala Pro Lys Lys His Arg

1

5

10

15

<210> 168

<211> 12

<212> PRT

<213> Human papillomavirus type 16

<400> 168

Pro Lys Pro Ser Pro Trp Ala Pro Lys Lys His Arg

1

5

10

<210> 169

<211> 13

<212> PRT

<213> Artificial sequence

<220>

Sequence 1: Human papillomavirus type 16, complete genome, NC_001491.1

<400> 169

Met Ala Asp Pro Ala Ala Ala Thr Lys Tyr Pro Leu Cys

1

5

10

<210> 170

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Peptide

<400> 170

Leu Ile Arg Gly Ala Phe Asp Tyr

1

5

<210> 171

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 171

Asn Ser Arg Asp Ser Ser Gly Gly Asn Ala Val

1

5

10

<210> 172

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
peptide

<400> 172

Leu Val Gln Gly Ser Phe Asp Tyr

1

5

<210> 173

<211> 8

<212> PPT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: number 173

10.0 μg. Dextran Blue Vio.

44-1174

10.0 μg. Dextran

10.0 μg. DNA

10.0 μg. Artificial Sequence

10.0 μg.

11.0 μg. Description of Artificial Sequence: synthetic
oligonucleotide

10.0 μg.

10.0 μg. Dextran Blue

10.0 μg. Dextran Blue

10.0 μg. Dextran Blue
positions 34-49 can be any of G, A, T, or C

44-1174

10.0 μg. Dextran Blue
positions 34-49 can be any of G, A, T, or C

10.0 μg.

1

<220>

<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 175

taatacgact cactataggg agacaagaat aaacgctcaa 40

<210> 176

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
oligonucleotide

<400> 176

gcctgttgtg agcctcctgt cgaa 24

<210> 177

<211> 90

<212> DNA

gcctgttgtg agcctcctgt cgaa

Transcription of Artificially Prepared Synthetic

and Natural Ribosomal RNA and its Dependence on

Cellular RNA

and Cell-free Extracts

of the "R" and "P" positions of the rat liver ribosomes

and Cell-free Extracts

containing the initiating polyribosomal adenosine triphosphate (ATP)

and the initiation factor I

and Cell-free Extracts

and Cell-free Extracts

and Cell-free Extracts

and Cell-free Extracts

Transcription of Artificially Prepared in vitro

and Natural Ribosomal RNA, and its Dependence on the Cell-free Extracts

and Cell-free Extracts

and Cell-free Extracts

and Cell-free Extracts and the Cell-free Extracts

gggagacaag aauaaacgcu caannnnnn nnnnnnnnn nnnnnnnnn ucgacaggag 60

gcucacaca ggc

73

<210> 179

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
peptide

<400> 179

Asp Glu Ala Asp

1